SpinScooter

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PARTS:

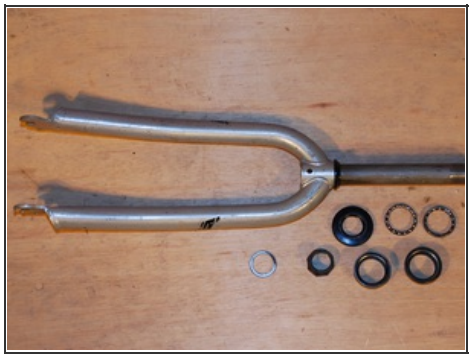
- BMX wheel (20") (1)
- Caster wheel (1)
  The larger the caster wheel, the more fine control you'll have, so get the biggest you can.
- Front fork (and bearing hardware) (1)
  The bearing hardware must fit the front fork.
- Head tube (1)
  The head tube must match the length of your fork stem.
- Handlebars (with matching gooseneck) (1)
  BMX-style handlebars work well. I used an 8" tall set.
- 1.5 inch or larger tubing (1)
  I used some spare 2 inch conduit elbows from my scrap bin.
- 1" conduit tubing (1)
  For bracing.
- 1/4" flatbar (for foot rest) (1)
  Can also use BMX foot pegs.
- Grip tape (1)
- Spray primer (Optional) (1)
- Spray paint (Optional) (1)

SUMMARY

Once in awhile I get the urge to create a new wild and crazy cycle based on some idea from the many sketches I've collected over the years. Sometimes these bikes work out as planned, creating new and fun ways to move from point A to point B. Sometimes these creations fail, either in a huge flop, or a blaze of glory where the crash test pilot gets to know

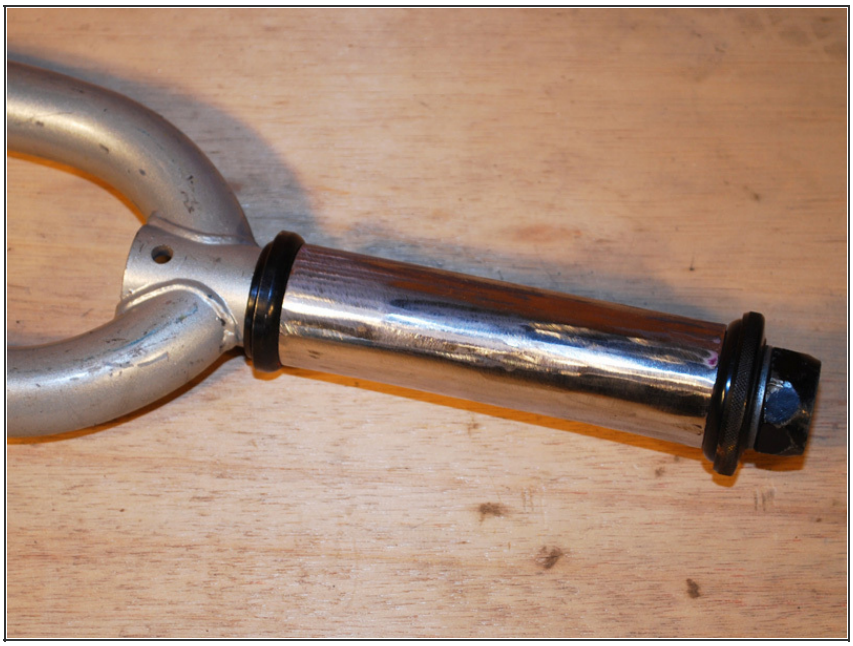
the pavement. This time, the plan worked out, resulting in a very unique and fun ride that's both challenging to master, and capable of some off-the-wall maneuvers.

Step 1 — Gathering Your Parts


- Here's the 20" BMX wheel and caster wheel I used. Rubber or air-filled casters are better than hard plastic ones. This one has a diameter of 8 inches and was taken from an old wheelchair.
- Just about any front fork will work for this project as long as the bearing hardware fits the stem. I wanted a bit more height on my scooter, so I chose a beefy looking 26 inch front fork. The bearing hardware includes two ball bearings, two bearing cups, a top threaded bearing race, a lock washer and a top nut. Notice that the bottom bearing race is slightly larger than the top, and when installing bearings, the balls go into the cups so that the flat part of the retainer is at facing up.

Step 2 — Testing the Fork Hardware



- When the fork hardware is installed as shown, you should be able to hold the head tube and spin the forks freely with very little friction. If the forks seem to stick, then either your bearings are installed the wrong way or some of the hardware is not of matching size.
- Yes, like all mechanical things in life, there are several sizes that look almost identical, yet will not work together properly. There is an underground committee of engineers that meet in secret to ensure that many similar standards exist in order to anger and confuse all those who dare to take things apart. Don't let them defeat you!

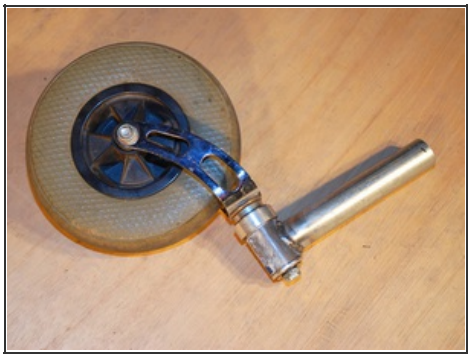
Step 3 — Making a Curved Frame the Easy Way

- This project can be built using any available 1.5 inch or larger tubing. Your goal is to place the front wheel and fork in a position similar to that of a regular bike, then create someplace to plant your feet.
- The distance between the front wheel and rear caster is about 12-16 inches. Don't worry about the angles and measurements, just build the scooter using the parts you have on hand.
- I didn't plan any of this project, and there's no doubt that it can be modified to perform better -- use your imagination and just start cutting some tubing!
- To calculate the lengths and dimensions of the main frame, lay the wheels on the ground so that the distance between tire edges is about 12-16 inches and then fill in the blanks. As for head tube and caster angle, anything between 10 and 15 degrees will work just fine. The slight angle of the caster gives your scooter a bit more control for straight line riding, and the head tube angle helps with fine control of the vehicle. Again, feel free to alter these angles to see what happens!
- My frame is S-shaped, as shown here after cutting and welding the conduit elbows together end to end. Square tubing or heavy bicycle tubing also works, but tubing with a diameter of less than 1.25 inches might be too thin and could bend. To keep the two elbows aligned, they were placed on a flat surface and tack welded together. The entire joint was then completed, ensuring proper penetrations for strength.

Step 4 — Laying Out the Full Frame

- This image shows the basic layout plan. Place the parts on the ground and fill in the blanks. I wanted my feet to be only a few inches from the ground so that it would be easy to operate the unit as a standard kick scooter, so the pegs were placed to allow a 3 inch ground clearance, enough to avoid scraping the ground during tight corners and spins.
- Notice how the front head tube is angled slightly forward while the rear caster is angled slightly backwards. This 10-15 degree caster angle allows for more stable control when actually trying to move in a straight line.

Step 5 — Creating the Rear Caster Wheel Support Arm



- To join the rear caster wheel to the frame, a small 1 inch conduit tube was cut to a length of 8 inches and welded to the caster wheel's tiny head tube.
- If you're using a shopping cart caster, then it will have a bolt, not a head tube and will require a hole to mount it to your frame tubing. A piece of flatbar or angle iron would also work for mounting a bolt style caster to your scooter.
- The 1 inch diameter tube that connects the casters to the frame needed to be strengthened, so a bit of rod was cut to form a triangle as shown in the second image. This gusset or truss will add amazing strength to the caster support arm, which may not have been strong enough to withstand the weight of a "big kid" by itself.
- The caster support tube and truss rod is shown welded to the frame in the third picure. Initially tack-weld all parts together so you can visually inspect alignment.
- Both wheels should be inline when they are in the straight ahead position so that your scooter tracks properly when attempting to drive in a straight line... "attempting" being the key word here!

Step 6 — Welding the Head Tube to the Main Frame Tube

- Once you have all of your bits and pieces tack-welded together and have checked for wheel alignment, complete all welding by going around the entire joint.
- Notice the same small type of truss rod has been installed at the head tube joint to add strength to the scooter in case of a front end collision with an "immovable object" such as a wall or curb. This scooter was born to crash, so the stronger you can make the frame, the longer it will survive.

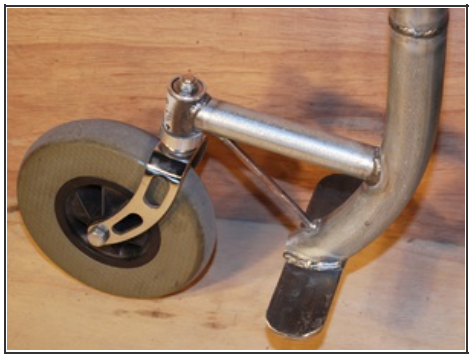
Step 7 — Installing the Wheels

- The main frame aseembly is shown here with both of the wheels installed and all tube joints fully welded.
- Now, the only other part we need to fabricate is a place to rest your feet on. And we need a set of handlebars to hold on to.

Step 8 — Installing Handlebars

- A pair of tall BMX style handlebars works best for this project, as you will require a little height rather than having to bend over to steer.
- This image shows a typical 8 inch tall set of BMX handlebars and a matching gooseneck to hold them.
- Note that goosenecks come in two sizes, and although the larger sized gooseneck will not fit into the smaller sized fork stem, the smaller gooseneck will indeed fit into the larger fork stem, but will eventually work its way free or fall out.
- This is more evildoing by the secret non-standards committee, so be careful. There should be no play between the gooseneck tubing and the fork stem.

Step 9 — Creating the Foot Platform or Peg


- To stand on your scooter, you'll need a foot peg or platform. There are many options, including BMX pegs or even a skateboard plank, so use your imagination.
- The first image shows two options I considered: a standard round BMX peg and a platform made of some 1/4 inch thick flatbar. I opted for the flatbar as I wanted to use the foot pegs for another project. Remember to round off all sharp edges, especially ones that are guaranteed to be smashing into you at high speed like this will.
- The flatbar platform is shown installed here after rounding off the sharp edges using a grinder and a sanding disc. The flatbar worked out better than the BMX foot pegs, as it keeps my feet closer to the ground, making it easier to reach down and kick for acceleration.
- A little grip tape will help keep your feet in place, or you can take a grinder disc and carve the top of the plate as shown here to add a little more grip.
- Grip tape can be found at any skateboard shop and works perfectly for this application

Step 10 — Testing and Painting

- The completed and ready to be painted SpinScooter is shown here after many runs up and down the only clean section in my garage. Although I crashed several times into the wall and the giant pile of twisted bicycle scrap, the SpinScooter showed great promise, able to scoot in a straight line when I wasn't attempting to do a 360.
- I thought about putting a front hubmotor and battery pack on the scooter before painting, but that little voice in my head that helps keep me alive said, "Dude, are you totally insane?!" I decided that kick speed would be the best option!
- After a fresh coat of paint, the SpinScooter is ready to ride. I paint all of my bikes with department store spray paint, and if you take the time to use a good spray primer and let coats cure overnight, you can have a very pro looking paint job for a few bucks. The bright yellow gave the SpinScooter a tamer look, as if to mask its evil personality.

Step 11

- Learning How to Tame Your New Ride
- There's not much to learn when first trying the SpinScooter, but be prepared to wipe out! Because you can pull a complete 360, you'll need to find that "point of no return" where the combination of front and rear steering overwhelms the bike, sending you into a vortex of pain.
- After some practice, I was able to fishtail, 360, T-slide, and drive without ending up on my back. It takes a bit of getting used to, but it does offer a ride like no other scooter, that's for sure. As for just moving in a straight line, the SpinScooter does well there, behaving like any decent kick scooter.
- Have fun with your new wheels! If you think this project is a bit too scary for your liking, then have a look at our SpinCycle Stunt Trike which, due to its three-wheel configuration, will allow you to do all of the 360s and spin slides you want without the risk of falling over.

For more on bike-making, repair, and maintenance, see MAKE's Bikeshop Skill Builder series.

For more bike how-tos and bike plans, check out the Atomic Zombie website.

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